

NOTES ON THE DISTRIBUTION AND HABITS OF
THE TWO SPECIES OF ARPHIA (ORTHOPTERA,
ACRIDIDÆ) THAT OCCUR IN NEW YORK
AND NEW JERSEY

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Arphia sulphurea (Burm.), and *Arphia xanthoptera* (Fab.), the only two species of this genus that occur in New York or New Jersey, are rather large, compressed species. *A. sulphurea* is the smaller of the two, although I have noticed intergradations of size in the same locality. On the average, the size of the body of *xanthoptera* is as follows: ♂ 21-27 mm., ♀ 28-34 mm. *Sulphurea*, the smaller, runs as follows: ♂ 17-22 mm., ♀ 26-30 mm.

Arphia sulphurea appears earlier in the season than *xanthoptera*, passing the winter as a nymph. It begins to reach maturity about May 1, making it one of the earliest locusts to make its appearance in these states. Throughout June it is extremely abundant, but about July 15, it begins to be replaced by *xanthoptera*. At Tuxedo Pk., New York, in the Ramapo Mts., I have noticed that about July 20, *A. sulphurea* begins to diminish in numbers, while on or about July 31, *xanthoptera* begins to appear in increasing numbers throughout August, until as late as November 1. *Arphia xanthoptera* does not pass the winter in the nymphal stage as does *sulphurea*, but appears from eggs hatched in the spring; reaching its full growth on or about July 25 in most localities. However, *xanthoptera* occurs as late as November 1, while *sulphurea* may occur until September 10, but I have not found such specimens common.

The general range of *xanthoptera* as given by W. S. Blatchley (1920) is from "southern New England, west to Minnesota and western Nebraska, and south and southwest to central Florida, Oklahoma and northern Texas." Of *sulphurea* he says: "New England and Ontario, west to Minnesota and eastern Nebraska, and south and southwest to northern Florida, Oklahoma and Texas." Morse (1919), "List of the Orthoptera of New England," states that *sulphurea* probably occurs throughout

New England, though not as yet recorded from north of Deering and Norway, Maine; Berlin Falls and Hanover, New Hampshire.

Both *xanthoptera* and *sulphurea* are very common species, occurring in almost identical habitat. They both frequent the stubble of wheat, clover, and timothy fields, preferably in dry upland situations. *Arphia sulphurea* seems to me to show a more woodland choice of habitat than does *xanthoptera*. The former likes its fields bordering on woods if possible, although both species frequent the edges of fields, roads, and the sides of railway embankments. *Sulphurea* also shows a preference for gravelly and rocky slopes. Some of the nymphs and a few of the adults observed at Tuxedo Pk., New York, early in the season, had the pronotum and hind femora tinged with greenish coloration. This coloration seemed to be such that it harmonized with the lichens that occurred on the rocks in that vicinity. The young nymphs of *sulphurea* can be found during the winter, when on warmer days they come out of hiding to sun themselves. In Bronxville, New York, I have found the nymphs in numbers about March 25 on a small hill having a sunny southern exposure. The nymphs would crawl about, their antennæ twitching nervously most of the time. They seemed to be fairly gregarious at this stage.

The flight habits of both *sulphurea* and *xanthoptera* are more or less similar; however, I have noticed some differences between the two. The stridulation of the male *sulphurea* is to be heard continuously once the insect has spread its wings. The female of this species does not make any audible sound, but flies in a straight line for about ten to thirty feet, whence she drops quickly to the ground, as do almost all *sulphurea*, in dead leaves, showing a definite preference for them. The male, however, stridulates when flushed to or three times, then usually ceases upon being flushed again. The male *xanthoptera* stridulates when it rises from the ground, and at every turn in its course of flight. The sound thus produced is much louder and more prolonged than that of *sulphurea*. The flight of this species is also more prolonged, ranging from ten to fifty feet. When the two locusts are in company with each other, it is usually possible to differentiate the males of the two species by their respective

stridulations. The females of both species are silent, and not as willing to take to the wing as are the males.

Both *Arphia sulphurea* and *xanthoptera* are to be found generally throughout New York and New Jersey; providing, of course, that the habitat and the date are suitable to the species. However, some records might prove helpful to the collector, as follows:

In the collection of the American Museum of Natural History in New York City, *Arphia sulphurea* is recorded from: West Farms, N. Y. C. (Angus, coll.), New York, N. Y., Rahway, N. J. (May 30), Huguenot Sta., N. Y. C. (June 26), Guymard, N. J. (June 9), Bear Swamp, N. J. (July 10), Carmel, N. Y., (Aug. 12), Lakehurst, N. J. (July 4, Olsen coll.), Plainfield, N. J. (June 2), Ramsey, N. J. (May 21), Crugers, N. Y. (July 10, 1912), Englewood, N. J. (June 28, Mitchner coll.), Ft. Lee, N. J. (June 28), Paterson, N. J. (June 17).

In the same collection, *xanthoptera* is recorded from: Lakehurst, N. J. (Sept.), Bronxville, N. Y. (Sept.), Ft. Lee, N. J. (Sept. 20), Baldwin, N. Y. (Aug. 18), West Farms, N. Y. C. (Aug. 20), Hartsdale, N. Y. (Aug. 26), Toms River, N. J. (Aug. 18), Ramsey, N. J. (Sept. 28), Nyack, N. J. (Sept.), Ellenville, N. Y. (Aug. 15).

J. B. Smith (1909), "Insects of New Jersey," lists the distribution of *sulphurea* as being: "throughout the state, commoner south of Piedmont Plain (Apr.-July)," found in "waste places along the edge of woods and about cranberry bogs."

The same author speaks of *xanthoptera* as being: "common south of Piedmont Plain (August-October)," inhabiting "waste grassy and sandy fields, woodland roads, and along the edges of woods." He further states that: "North of that point (Piedmont Plain) it occurs at Ft. Lee, Orange Mts., Middlesex County, and Staten Island (Aug.-Oct.)."

In "A List of the Insects of New York," edited by M. D. Leonard (1928), *sulphurea* are reported as occurring in:

New York: White Plains, Ft. Montgomery, West Point, Croton, Oliveria, Elmira, Ithaca, Conensus Lake, Rochester, and the Ramapo Mts., all May-July.

Staten Island: "Generally distributed. Reaches maturity

about May 15, from overwintering nymphs. A few survive until Aug. 1, or later."

Long Island: Central Pk., Massapequa, West Hills, Half Way Hollow Hills, Nissequoque, Kings Park, Yaphank (Sept. 3 latest date), Riverhead, and Wading River, all from May-July.

The same list records *xanthoptera* as follows:

New York: Bronxville, Nyack, and the Ramapo Mts., (August-October).

Staten Island: "Generally distributed from St. George to Totenville, August-October."

Long Island: Maspeth, Central Pk., Cold Sp., Smithtown, Selden, Coram, Yaphank, Southold, Orient, Amagansett, Montauk, and Gardiners Island, during the months of August and October.

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